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VINE PRUNING SYSTEMS

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The various systems of vine pruning are distinguished by the form that is given to the more or less permanent part of the vine and by the kind and amount of annual growth that is left at the winter pruning. The systems which appear most adapted to the conditions of grape growing in California belong to three groups: (1) Head Pruning; (2) Cane Pruning; (3) Cordon Pruning.

1. *Head pruning*.—In systems of this group the vine is given the form of a small self-supporting tree or bush. The fully formed vine consists of an upright "trunk," $1\frac{1}{2}$ to $3\frac{1}{2}$ feet high, dividing at the top into a ring of 4 to 8 ascending "arms," 6 to 18 inches long. At the end of each of these arms is left at the winter pruning 1 or 2 "spurs" consisting of 1, 2, or 3 joints of the basal portions of the "canes" which grew the preceding summer.

Figure 1 shows a typical head-pruned vine of good form with a trunk 18 inches high. This is as low as is usually advisable. Three well-formed arms arising at a good angle are already about 8



Fig. 1.—Head pruned Muscat six years old.

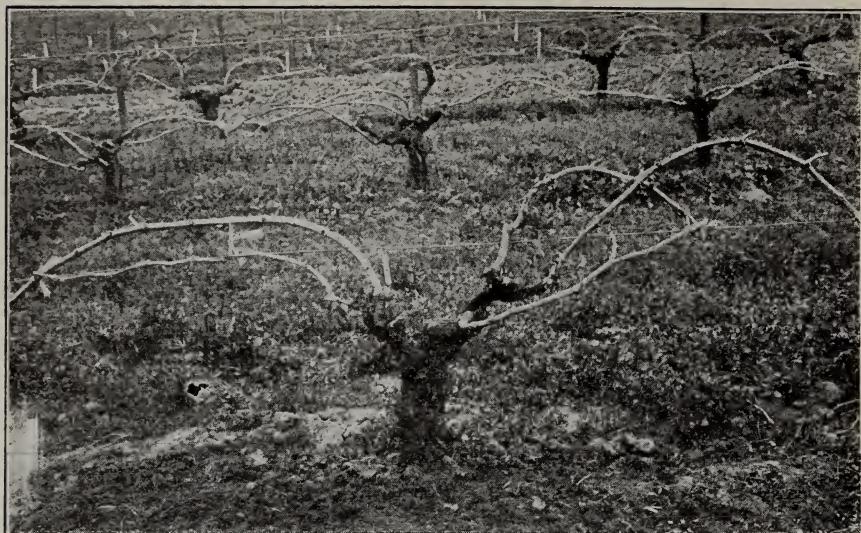


Fig. 2.—Cane pruned Sultana, eleven years old.

inches long. Near the base on each of these arms a spur has been left from which other arms will develop. Finally this vine will have a vase-formed head with about 6 arms. At this stage it has 8 spurs mostly with 2 joints, which with the bud at the base of each spur gives 24 possible fruit buds.

However long the vine lives the height of the trunk will not change. The height of the spurs may be controlled by a greater or less elongation of the arms.

2. *Cane pruning*.—In this system the vine is given a trunk of similar form and from 2 to 3 feet high. This trunk, on a mature vine, divides at the top into 4 arms, 6 to 12 inches long. These arms extend like an open fan in the direction of the horizontal wire which supports the canes. At the end of each arm is left a "fruit cane," 2 to 5 feet long with 10 to 20 buds each. On weak vines 1 or more of these canes is omitted, on very vigorous vines one or two extra canes may be left. On each arm is also left, below the cane where possible, 1 or occasionally 2 "renewal spurs" of 1 or 2 buds to supply fruit canes for the following year.

Figure 2 shows a cane-pruned vine of good form except that the trunk is too low. At the end of each arm has been left a fruit cane and a renewal spur. As the vine is exceptionally vigorous an extra fruit cane has been left near the middle of an arm to the right. The lower cane to the left is too long for so weak a cane. The other canes are very vigorous and the number of fruit buds has been increased by leaving 1 or 2 joints of the strong "laterals" on these canes.



Fig. 3.—Cordon pruned Emperor four years old.

3. *Cordon pruning*.—In this system the vine is given a long, relatively slender trunk which extends horizontally at about 30 inches from the ground until it reaches the next vine. On top of this trunk along its horizontal part are developed upright arms, 4 to 12 inches long at intervals of 8 to 12 inches. The annual growth left at the winter pruning consists of spurs or rarely of fruit canes at the end of these arms.

Figure 3 shows a cordon-pruned vine of good form. It consists of a trunk about 10 feet long which rises from the ground in a smooth curve or quarter circle and then extends horizontally along a wire at 30 inches from the ground until it reaches the next vine.

On this trunk, commencing at the point where it becomes horizontal have been left spurs of 2 to 3 joints about every 12 inches. As the vine becomes older these spurs will gradually develop into arms, on the end of each of which will be left 1 or 2 similar spurs. The height of these spurs from the ground, and consequently the position of the fruit, can be modified by developing arms of greater or less length.

ADVANTAGES OF EACH SYSTEM

Where *head pruning* is adopted, the vines require no trellises and may therefore be planted so that cross cultivation is possible. Stakes are necessary at first, but they can usually be discarded after 4 to 6 years when the trunks of the vines have developed sufficiently to be self-supporting. This is the easiest system to establish, but considerable care and skill are required to keep the vines in shape as they grow older.

Cane pruning is necessary for varieties which will not bear well on short spurs. It requires a permanent horizontal trellis consisting

of a well-supported horizontal No. 12 galvanized iron wire at about 30 to 40 inches from the ground to which the fruit-canapes are attached in order to increase their fruitfulness and to prevent them from shading the renewal spurs which need sunlight to produce good fruit canes for the following year. A similar wire is usually placed about 12 inches above the first to support the growing shoots. This system is fairly simple to establish but vines pruned by it are the most difficult to keep in shape when they become large.

Cordon pruning is necessary for varieties which do not bear sufficiently on spurs and which produce grapes of inferior quality on canes. It is useful also for most vigorous, large-fruited varieties of table grapes. It requires a permanent trellis similar to that used in cane pruning to support the horizontal trunk. Some of its advantages are that it increases the fruitfulness of the canes so that nearly all varieties will bear on the lowest buds, and that it promotes large size of the berries and bunches, and high uniform quality. It is the most laborious of the three to establish during the first four years, but, when established, it is the simplest and perhaps the most economical to maintain.

CHOICE OF A SYSTEM

In nearly all cases where the *head pruning* system is known to give perfectly satisfactory results, it should be chosen. It is the most economical and best understood by most grape growers. It usually gives good results with the following varieties of grapes:

Medium trunk: Muscat, Verdal, Palomino, Zinfandel, Alicante Bouschet, Duriff (Petite Sirah), Beclan, Grand Noir.

High trunk: Tokay, Rose of Peru, Black Prince, Mission, Malaga.

Cane pruning should be adopted only when neither of the other systems gives as good results. It is used almost always for Sultanina, Sultana, Black Corinth, Pierce, Concord, Isabella, Catawba, and most Labrusca varieties.

Cordon pruning can be recommended for Emperor, Ohanez, Cornichon, Molinera, Black Monukka, Zabalkanski, and most vigorous large-fruited table grapes, especially when growing in very fertile soil.

For general information regarding vine pruning, see Bulletin 241-246, "Vine Pruning in California." For special directions regarding these three systems, see, for: Head-pruning, Bulletin 241-46, pp. 69-88; Cane-pruning, Circular 191, "Pruning the Seedless Grapes"; Cordon-pruning, Circular 229, "Cordon Pruning."